SEQUENCE LISTING

<110> Saba, Julie D.
      Fyrst, Henrik

<120> SPHINGOSINE-1-PHOSPHATE LYASE POLYPEPTIDES,
      POLYNUCLEOTIDES AND MODULATING AGENTS AND
      METHODS OF USE THEREFOR

<130> 200116.402C2

<140> US
<141> 2002-01-17

<160> 21

<170> FastSEQ for Windows Version 4.0

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<213> S. cerevisiae

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Met Ser Gly Val Ser Asn Lys Thr Val Ser Ile Asn Gly Trp Tyr Gly
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atg cca att cat tta cta agg gaa gaa ggc gac ttt gcc cag ttt atg   96
Met Pro Ile His Leu Leu Arg Glu Glu Gly Asp Phe Ala Gln Phe Met
            20   25   30

att cta acc atc aac gaa tta aaa ata gcc ata cat ggt tac ctc aga   144
Ile Leu Thr Ile Asn Glu Leu Lys Ile Ala Ile His Gly Tyr Leu Arg
            35   40   45

aat acc cca tgg tac aac atg ttg aag gat tat ttg ttt gtg atc ttt   192
Asn Thr Pro Trp Tyr Asn Met Leu Lys Asp Tyr Leu Phe Val Ile Phe
        50   55   60

tgt tac aag cta ata agt aat ttt ttt tat ctg ttg aaa gtt tat ggg   240
Cys Tyr Lys Leu Ile Ser Asn Phe Phe Tyr Leu Leu Lys Val Tyr Gly
 65   70   75   80

ccg gtg agg tta gca gtg aga aca tac gag cat agt tcc aga aga ttg   288
Pro Val Arg Leu Ala Val Arg Thr Tyr Glu His Ser Ser Arg Arg Leu
                85   90   95

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ttt cgt tgg tta ttg gac tca cca ttt ttg agg ggt acc gta gaa aag   336
Phe Arg Trp Leu Leu Asp Ser Pro Phe Leu Arg Gly Thr Val Glu Lys
            100             105             110

gaa gtc aca aag gtc aaa caa tcg atc gaa gac gaa cta att aga tcg   384
Glu Val Thr Lys Val Lys Gln Ser Ile Glu Asp Glu Leu Ile Arg Ser
            115             120             125

gac tct cag tta atg aat ttc cca cag ttg cca tcc aat ggg ata cct   432
Asp Ser Gln Leu Met Asn Phe Pro Gln Leu Pro Ser Asn Gly Ile Pro
        130             135             140

cag gat gat gtt att gaa gag cta aat aaa ttg aac gac ttg ata cca   480
Gln Asp Asp Val Ile Glu Glu Leu Asn Lys Leu Asn Asp Leu Ile Pro
145             150             155             160

cat acc caa tgg aag gaa gga aag gtc tct ggt gcc gtt tac cac ggt   528
His Thr Gln Trp Lys Glu Gly Lys Val Ser Gly Ala Val Tyr His Gly
                165             170             175

ggt gat gat ttg atc cac tta caa aca atc gca tac gaa aaa tat tgc   576
Gly Asp Asp Leu Ile His Leu Gln Thr Ile Ala Tyr Glu Lys Tyr Cys
            180             185             190

gtt gcc aat caa tta cat ccc gat gtc ttt cct gcc gta cgt aaa atg   624
Val Ala Asn Gln Leu His Pro Asp Val Phe Pro Ala Val Arg Lys Met
            195             200             205

gaa tcc gaa gtg gtt tct atg gtt tta aga atg ttt aat gcc cct tct   672
Glu Ser Glu Val Val Ser Met Val Leu Arg Met Phe Asn Ala Pro Ser
        210             215             220

gat aca ggt tgt ggt acc aca act tca ggt ggt aca gaa tcc ttg ctt   720
Asp Thr Gly Cys Gly Thr Thr Thr Ser Gly Gly Thr Glu Ser Leu Leu
225             230             235             240

tta gca tgt ctg agc gct aaa atg tat gcc ctt cat cat cgt gga atc   768
Leu Ala Cys Leu Ser Ala Lys Met Tyr Ala Leu His His Arg Gly Ile
                245             250             255

acc gaa cca gaa ata att gct ccc gta act gca cat gct ggg ttt gac   816
Thr Glu Pro Glu Ile Ile Ala Pro Val Thr Ala His Ala Gly Phe Asp
            260             265             270

aaa gct gct tat tac ttt ggc atg aag cta cgc cac gtg gag cta gat   864
Lys Ala Ala Tyr Tyr Phe Gly Met Lys Leu Arg His Val Glu Leu Asp
            275             280             285

cca acg aca tat caa gtg gac ctg gga aaa gtg aaa aaa ttc atc aat   912
Pro Thr Thr Tyr Gln Val Asp Leu Gly Lys Val Lys Lys Phe Ile Asn
            290             295             300

aag aac aca att tta ctg gtc ggt tcc gct cca aac ttt cct cat ggt   960
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Lys Asn Thr Ile Leu Leu Val Gly Ser Ala Pro Asn Phe Pro His Gly
305                 310             315                 320

att gcc gat gat att gaa gga ttg ggt aaa ata gca caa aaa tat aaa   1008
Ile Ala Asp Asp Ile Glu Gly Leu Gly Lys Ile Ala Gln Lys Tyr Lys
                    325             330             335

ctt cct tta cac gtc gac agt tgt cta ggt tcc ttt att gtt tca ttt   1056
Leu Pro Leu His Val Asp Ser Cys Leu Gly Ser Phe Ile Val Ser Phe
                340             345             350

atg gaa aag gct ggt tac aaa aat ctg cca tta ctt gac ttt aga gtc   1104
Met Glu Lys Ala Gly Tyr Lys Asn Leu Pro Leu Leu Asp Phe Arg Val
            355             360             365

ccg gga gtc acc tca ata tca tgt gac act cat aaa tat gga ttt gca   1152
Pro Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Phe Ala
            370             375             380

cca aaa ggc tcg tca gtt ata atg tat aga aac agc gac tta cga atg   1200
Pro Lys Gly Ser Ser Val Ile Met Tyr Arg Asn Ser Asp Leu Arg Met
385                 390             395                 400

cat cag tat tac gta aat cct gct tgg act ggc ggg tta tat ggc tct   1248
His Gln Tyr Tyr Val Asn Pro Ala Trp Thr Gly Gly Leu Tyr Gly Ser
                405             410             415

cct aca tta gca ggg tcc agg cct ggt gct att gtc gta ggt tgt tgg   1296
Pro Thr Leu Ala Gly Ser Arg Pro Gly Ala Ile Val Val Gly Cys Trp
            420             425             430

gcc act atg gtc aac atg ggt gaa aat ggg tac att gag tcg tgc caa   1344
Ala Thr Met Val Asn Met Gly Glu Asn Gly Tyr Ile Glu Ser Cys Gln
            435             440             445

gaa ata gtc ggt gca gca atg aag ttt aaa aaa tac atc cag gaa aac   1392
Glu Ile Val Gly Ala Ala Met Lys Phe Lys Lys Tyr Ile Gln Glu Asn
        450             455             460

att cca gac ctg aat ata atg ggc aac cct aga tat tca gtc att tca   1440
Ile Pro Asp Leu Asn Ile Met Gly Asn Pro Arg Tyr Ser Val Ile Ser
465             470             475             480

ttt tct tca aag acc ttg aac ata cac gaa cta tct gac agg ttg tcc   1488
Phe Ser Ser Lys Thr Leu Asn Ile His Glu Leu Ser Asp Arg Leu Ser
            485             490             495

aag aaa ggc tgg cat ttc aat gcc cta caa aag ccg gtt gca cta cac   1536
Lys Lys Gly Trp His Phe Asn Ala Leu Gln Lys Pro Val Ala Leu His
            500             505             510

atg gcc ttc acg aga ttg agc gct cat gtt gtg gat gag atc tgc gac   1584
Met Ala Phe Thr Arg Leu Ser Ala His Val Val Asp Glu Ile Cys Asp
            515             520             525
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att tta cgt act acc gtg caa gag ttg aag agc gaa tca aat tct aaa     1632
Ile Leu Arg Thr Thr Val Gln Glu Leu Lys Ser Glu Ser Asn Ser Lys
    530             535             540

cca tcc cca gac gga act agc gct cta tat ggt gtc gcc ggg agc gtt     1680
Pro Ser Pro Asp Gly Thr Ser Ala Leu Tyr Gly Val Ala Gly Ser Val
545             550             555             560

aaa act gct ggc gtt gca gac aaa ttg att gtg gga ttc cta gac gca     1728
Lys Thr Ala Gly Val Ala Asp Lys Leu Ile Val Gly Phe Leu Asp Ala
            565             570             575

tta tac aag ttg ggt cca gga gag gat acc gcc acc aag tag           1770
Leu Tyr Lys Leu Gly Pro Gly Glu Asp Thr Ala Thr Lys  *
            580             585
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<212> PRT
<213> S. cerevisiae

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            20              25              30
Ile Leu Thr Ile Asn Glu Leu Lys Ile Ala Ile His Gly Tyr Leu Arg
            35              40              45
Asn Thr Pro Trp Tyr Asn Met Leu Lys Asp Tyr Leu Phe Val Ile Phe
    50              55              60
Cys Tyr Lys Leu Ile Ser Asn Phe Phe Tyr Leu Leu Lys Val Tyr Gly
65              70              75              80
Pro Val Arg Leu Ala Val Arg Thr Tyr Glu His Ser Ser Arg Arg Leu
            85              90              95
Phe Arg Trp Leu Leu Asp Ser Pro Phe Leu Arg Gly Thr Val Glu Lys
            100             105             110
Glu Val Thr Lys Val Lys Gln Ser Ile Glu Asp Glu Leu Ile Arg Ser
            115             120             125
Asp Ser Gln Leu Met Asn Phe Pro Gln Leu Pro Ser Asn Gly Ile Pro
    130             135             140
Gln Asp Asp Val Ile Glu Glu Leu Asn Lys Leu Asn Asp Leu Ile Pro
145             150             155             160
His Thr Gln Trp Lys Glu Gly Lys Val Ser Gly Ala Val Tyr His Gly
            165             170             175
Gly Asp Asp Leu Ile His Leu Gln Thr Ile Ala Tyr Glu Lys Tyr Cys
            180             185             190
Val Ala Asn Gln Leu His Pro Asp Val Phe Pro Ala Val Arg Lys Met
            195             200             205
Glu Ser Glu Val Val Ser Met Val Leu Arg Met Phe Asn Ala Pro Ser
    210             215             220
Asp Thr Gly Cys Gly Thr Thr Thr Ser Gly Gly Thr Glu Ser Leu Leu
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225                    230                    235                    240
Leu Ala Cys Leu Ser Ala Lys Met Tyr Ala Leu His His Arg Gly Ile
                245                    250                    255
Thr Glu Pro Glu Ile Ile Ala Pro Val Thr Ala His Ala Gly Phe Asp
                260                    265                    270
Lys Ala Ala Tyr Tyr Phe Gly Met Lys Leu Arg His Val Glu Leu Asp
                275                    280                    285
Pro Thr Thr Tyr Gln Val Asp Leu Gly Lys Val Lys Lys Phe Ile Asn
    290                    295                    300
Lys Asn Thr Ile Leu Leu Val Gly Ser Ala Pro Asn Phe Pro His Gly
305                    310                    315                    320
Ile Ala Asp Asp Ile Glu Gly Leu Gly Lys Ile Ala Gln Lys Tyr Lys
                325                    330                    335
Leu Pro Leu His Val Asp Ser Cys Leu Gly Ser Phe Ile Val Ser Phe
                340                    345                    350
Met Glu Lys Ala Gly Tyr Lys Asn Leu Pro Leu Leu Asp Phe Arg Val
                355                    360                    365
Pro Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Phe Ala
                370                    375                    380
Pro Lys Gly Ser Ser Val Ile Met Tyr Arg Asn Ser Asp Leu Arg Met
385                    390                    395                    400
His Gln Tyr Tyr Val Asn Pro Ala Trp Thr Gly Gly Leu Tyr Gly Ser
                405                    410                    415
Pro Thr Leu Ala Gly Ser Arg Pro Gly Ala Ile Val Val Gly Cys Trp
                420                    425                    430
Ala Thr Met Val Asn Met Gly Glu Asn Gly Tyr Ile Glu Ser Cys Gln
                435                    440                    445
Glu Ile Val Gly Ala Ala Met Lys Phe Lys Lys Tyr Ile Gln Glu Asn
    450                    455                    460
Ile Pro Asp Leu Asn Ile Met Gly Asn Pro Arg Tyr Ser Val Ile Ser
465                    470                    475                    480
Phe Ser Ser Lys Thr Leu Asn Ile His Glu Leu Ser Asp Arg Leu Ser
                485                    490                    495
Lys Lys Gly Trp His Phe Asn Ala Leu Gln Lys Pro Val Ala Leu His
                500                    505                    510
Met Ala Phe Thr Arg Leu Ser Ala His Val Val Asp Glu Ile Cys Asp
                515                    520                    525
Ile Leu Arg Thr Thr Val Gln Glu Leu Lys Ser Glu Ser Asn Ser Lys
    530                    535                    540
Pro Ser Pro Asp Gly Thr Ser Ala Leu Tyr Gly Val Ala Gly Ser Val
545                    550                    555                    560
Lys Thr Ala Gly Val Ala Asp Lys Leu Ile Val Gly Phe Leu Asp Ala
                565                    570                    575
Leu Tyr Lys Leu Gly Pro Gly Glu Asp Thr Ala Thr Lys
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<210> 3
<211> 1629
<212> DNA
<213> C. elegans

<220>
<221> CDS

<220> (1)...(1629)

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Met Asp Phe Ala Leu Glu Gln Tyr His Ser Ala Lys Asp Leu Leu Ile
 1               5                   10                  15

ttt gag ctt cga aag ttc aat cca att gtt ctg gtt tct agt act att      96
Phe Glu Leu Arg Lys Phe Asn Pro Ile Val Leu Val Ser Ser Thr Ile
                20                  25                  30

gtt gca aca tac gta ctc acc aat ctg aga cat atg cat tta gat gaa     144
Val Ala Thr Tyr Val Leu Thr Asn Leu Arg His Met His Leu Asp Glu
            35                  40                  45

atg ggc atc cgg aaa cgt ttg agc act tgg ttt ttc acc act gta aag     192
Met Gly Ile Arg Lys Arg Leu Ser Thr Trp Phe Phe Thr Thr Val Lys
        50              55                  60

cgt gtg cct ttc atc agg aaa atg att gac aaa caa cta aac gaa gta     240
Arg Val Pro Phe Ile Arg Lys Met Ile Asp Lys Gln Leu Asn Glu Val
65                  70                  75                  80

aag gac gag ctt gag aaa agt ctg aga att gtg gat cga agc acc gaa     288
Lys Asp Glu Leu Glu Lys Ser Leu Arg Ile Val Asp Arg Ser Thr Glu
                85                  90                  95

tac ttc act aca atc cca agc cat tca gtt gga aga act gaa gta ctt     336
Tyr Phe Thr Thr Ile Pro Ser His Ser Val Gly Arg Thr Glu Val Leu
                100                 105                 110

cgc ctt gct gcc atc tat gat gat ttg gaa gga cca gct ttt ttg gaa     384
Arg Leu Ala Ala Ile Tyr Asp Asp Leu Glu Gly Pro Ala Phe Leu Glu
            115                 120                 125

gga aga gta tct gga gca gtc ttc aat aga gaa gac gac aag gac gaa     432
Gly Arg Val Ser Gly Ala Val Phe Asn Arg Glu Asp Asp Lys Asp Glu
        130                 135                 140

cgg gag atg tat gag gag gtg ttc gga aaa ttt gcc tgg acc aac cca     480
Arg Glu Met Tyr Glu Glu Val Phe Gly Lys Phe Ala Trp Thr Asn Pro
145                 150                 155                 160

ctt tgg cca aaa ttg ttc cct gga gtg aga atc atg gag gct gaa gtt     528
Leu Trp Pro Lys Leu Phe Pro Gly Val Arg Ile Met Glu Ala Glu Val
                165                 170                 175

gtt cgc atg tgt tgt aat atg atg aat gga gat tcg gag aca tgt gga     576
Val Arg Met Cys Cys Asn Met Met Asn Gly Asp Ser Glu Thr Cys Gly
            180                 185                 190

act atg tca act ggt gga tcc att tca att ctt ttg gcg tgc ctg gct     624
Thr Met Ser Thr Gly Gly Ser Ile Ser Ile Leu Leu Ala Cys Leu Ala
        195                 200                 205
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```
cat cgt aat cgt ctt ttg aaa aga gga gaa aag tac aca gag atg att    672
His Arg Asn Arg Leu Leu Lys Arg Gly Glu Lys Tyr Thr Glu Met Ile
    210             215             220

gtc cca tca tcc gtc cat gca gcg ttc ttc aaa gct gcc gaa tgt ttc    720
Val Pro Ser Ser Val His Ala Ala Phe Phe Lys Ala Ala Glu Cys Phe
225             230             235             240

cgt atc aaa gtt cgc aag att cca gtt gat cct gtt act ttc aaa gta    768
Arg Ile Lys Val Arg Lys Ile Pro Val Asp Pro Val Thr Phe Lys Val
            245             250             255

gac ctt gtc aaa atg aaa gcc gca att aac aag aga aca tgt atg tta    816
Asp Leu Val Lys Met Lys Ala Ala Ile Asn Lys Arg Thr Cys Met Leu
            260             265             270

gtt gga tct gct cca aac ttt cca ttt gga act gtt gat gac att gaa    864
Val Gly Ser Ala Pro Asn Phe Pro Phe Gly Thr Val Asp Asp Ile Glu
            275             280             285

gct att gga cag cta gga ctt gaa tat gac atc cca gtt cat gtt gat    912
Ala Ile Gly Gln Leu Gly Leu Glu Tyr Asp Ile Pro Val His Val Asp
    290             295             300

gct tgt ctt ggt ggt ttc ctt ctt cca ttc ctt gaa gaa gac gag att    960
Ala Cys Leu Gly Gly Phe Leu Leu Pro Phe Leu Glu Glu Asp Glu Ile
305             310             315             320

cgc tat gac ttc cgt gtt cct ggt gta tct tcg att tct gca gat agt   1008
Arg Tyr Asp Phe Arg Val Pro Gly Val Ser Ser Ile Ser Ala Asp Ser
            325             330             335

cac aaa tac gga ctc gct cca aag ggg tca tca gtt gtt ctt tat cgc   1056
His Lys Tyr Gly Leu Ala Pro Lys Gly Ser Ser Val Val Leu Tyr Arg
            340             345             350

aat aag gaa ctt ctt cat aat cag tac ttc tgt gat gct gat tgg caa   1104
Asn Lys Glu Leu Leu His Asn Gln Tyr Phe Cys Asp Ala Asp Trp Gln
            355             360             365

gga ggt atc tat gca tcg gct act atg gaa gga tca cgc gct ggg cac   1152
Gly Gly Ile Tyr Ala Ser Ala Thr Met Glu Gly Ser Arg Ala Gly His
    370             375             380

aac att gca ctt tgc tgg gcc gca atg ctt tat cac gct cag gaa gga   1200
Asn Ile Ala Leu Cys Trp Ala Ala Met Leu Tyr His Ala Gln Glu Gly
385             390             395             400

tac aag gcc aat gct aga aag att gtt gac act aca aga aag att aga   1248
Tyr Lys Ala Asn Ala Arg Lys Ile Val Asp Thr Thr Arg Lys Ile Arg
            405             410             415

aat gga ctt tca aac att aag gga atc aaa tta caa ggg cca agt gat   1296
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Asn Gly Leu Ser Asn Ile Lys Gly Ile Lys Leu Gln Gly Pro Ser Asp
            420                 425                 430

gtt tgt att gtt agc tgg aca acc aat gat gga gtt gaa ctc tac aga     1344
Val Cys Ile Val Ser Trp Thr Thr Asn Asp Gly Val Glu Leu Tyr Arg
        435                 440                 445

ttc cat aac ttc atg aag gaa aaa cat tgg caa ctg aat gga ctt caa     1392
Phe His Asn Phe Met Lys Glu Lys His Trp Gln Leu Asn Gly Leu Gln
        450                 455                 460

ttc cca gct gga gtt cat atc atg gtc act atg aat cat act cat cct     1440
Phe Pro Ala Gly Val His Ile Met Val Thr Met Asn His Thr His Pro
465                 470                 475                 480

gga ctc gct gaa gct ttc gtc gcc gat tgc aga gct gca gtt gag ttt     1488
Gly Leu Ala Glu Ala Phe Val Ala Asp Cys Arg Ala Ala Val Glu Phe
                485                 490                 495

gtc aaa agc cac aaa cca tcg gaa tcc gac aag aca agt gaa gca gcc     1536
Val Lys Ser His Lys Pro Ser Glu Ser Asp Lys Thr Ser Glu Ala Ala
            500                 505                 510

atc tac gga ctt gct caa agt att cca gac cga tcg ctt gtt cac gag     1584
Ile Tyr Gly Leu Ala Gln Ser Ile Pro Asp Arg Ser Leu Val His Glu
            515                 520                 525

ttt gct cac agc tat atc gat gct gtt tat gct tta aca gag tga         1629
Phe Ala His Ser Tyr Ile Asp Ala Val Tyr Ala Leu Thr Glu  *
        530                 535                 540


<210> 4
<211> 542
<212> PRT
<213> C. elegans

<400> 4
Met Asp Phe Ala Leu Glu Gln Tyr His Ser Ala Lys Asp Leu Leu Ile
 1             5                 10                  15
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            20                  25                  30
Val Ala Thr Tyr Val Leu Thr Asn Leu Arg His Met His Leu Asp Glu
            35                  40                  45
Met Gly Ile Arg Lys Arg Leu Ser Thr Trp Phe Phe Thr Thr Val Lys
        50                  55                  60
Arg Val Pro Phe Ile Arg Lys Met Ile Asp Lys Gln Leu Asn Glu Val
65                  70                  75                  80
Lys Asp Glu Leu Glu Lys Ser Leu Arg Ile Val Asp Arg Ser Thr Glu
            85                  90                  95
Tyr Phe Thr Thr Ile Pro Ser His Ser Val Gly Arg Thr Glu Val Leu
            100                 105                 110
Arg Leu Ala Ala Ile Tyr Asp Asp Leu Glu Gly Pro Ala Phe Leu Glu
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                115                   120                   125
Gly Arg Val Ser Gly Ala Val Phe Asn Arg Glu Asp Asp Lys Asp Glu
    130                   135                   140
Arg Glu Met Tyr Glu Glu Val Phe Gly Lys Phe Ala Trp Thr Asn Pro
145                   150                   155                   160
Leu Trp Pro Lys Leu Phe Pro Gly Val Arg Ile Met Glu Ala Glu Val
                165                   170                   175
Val Arg Met Cys Cys Asn Met Met Asn Gly Asp Ser Glu Thr Cys Gly
                180                   185                   190
Thr Met Ser Thr Gly Gly Ser Ile Ser Ile Leu Leu Ala Cys Leu Ala
                195                   200                   205
His Arg Asn Arg Leu Leu Lys Arg Gly Glu Lys Tyr Thr Glu Met Ile
            210                   215                   220
Val Pro Ser Ser Val His Ala Ala Phe Phe Lys Ala Ala Glu Cys Phe
225                   230                   235                   240
Arg Ile Lys Val Arg Lys Ile Pro Val Asp Pro Val Thr Phe Lys Val
                245                   250                   255
Asp Leu Val Lys Met Lys Ala Ala Ile Asn Lys Arg Thr Cys Met Leu
                260                   265                   270
Val Gly Ser Ala Pro Asn Phe Pro Phe Gly Thr Val Asp Asp Ile Glu
                275                   280                   285
Ala Ile Gly Gln Leu Gly Leu Glu Tyr Asp Ile Pro Val His Val Asp
            290                   295                   300
Ala Cys Leu Gly Gly Phe Leu Leu Pro Phe Leu Glu Glu Asp Glu Ile
305                   310                   315                   320
Arg Tyr Asp Phe Arg Val Pro Gly Val Ser Ser Ile Ser Ala Asp Ser
                325                   330                   335
His Lys Tyr Gly Leu Ala Pro Lys Gly Ser Ser Val Val Leu Tyr Arg
            340                   345                   350
Asn Lys Glu Leu Leu His Asn Gln Tyr Phe Cys Asp Ala Asp Trp Gln
            355                   360                   365
Gly Gly Ile Tyr Ala Ser Ala Thr Met Glu Gly Ser Arg Ala Gly His
    370                   375                   380
Asn Ile Ala Leu Cys Trp Ala Ala Met Leu Tyr His Ala Gln Glu Gly
385                   390                   395                   400
Tyr Lys Ala Asn Ala Arg Lys Ile Val Asp Thr Thr Arg Lys Ile Arg
                405                   410                   415
Asn Gly Leu Ser Asn Ile Lys Gly Ile Lys Leu Gln Gly Pro Ser Asp
            420                   425                   430
Val Cys Ile Val Ser Trp Thr Thr Asn Asp Gly Val Glu Leu Tyr Arg
            435                   440                   445
Phe His Asn Phe Met Lys Glu Lys His Trp Gln Leu Asn Gly Leu Gln
    450                   455                   460
Phe Pro Ala Gly Val His Ile Met Val Thr Met Asn His Thr His Pro
465                   470                   475                   480
Gly Leu Ala Glu Ala Phe Val Ala Asp Cys Arg Ala Ala Val Glu Phe
                485                   490                   495
Val Lys Ser His Lys Pro Ser Glu Ser Asp Lys Thr Ser Glu Ala Ala
            500                   505                   510
Ile Tyr Gly Leu Ala Gln Ser Ile Pro Asp Arg Ser Leu Val His Glu
            515                   520                   525
Phe Ala His Ser Tyr Ile Asp Ala Val Tyr Ala Leu Thr Glu
    530                   535                   540
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<220>
<221> CDS
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Met Pro Gly Thr Asp Leu Leu Lys Leu Lys Asp Phe Glu Pro Tyr Leu
 1               5                  10                  15

gag att ttg gaa tct tat tcc aca aaa gcc aag aat tat gtg aat gga      96
Glu Ile Leu Glu Ser Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
                20                  25                  30

tat tgc acc aaa tat gag ccc tgg cag ctc att gcg tgg agt gtc ctg     144
Tyr Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Leu
            35                  40                  45

tgt act ctg ctg ata gtc tgg gtg tat gag ctt atc ttc cag cca gag     192
Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu
        50                  55                  60

agt tta tgg tct cgg ttt aaa aaa aaa tta ttt aag ctt atc agg aag     240
Ser Leu Trp Ser Arg Phe Lys Lys Lys Leu Phe Lys Leu Ile Arg Lys
65                  70                  75                  80

atg cca ttt att gga cgt aag atc gaa caa cag gtg agc aaa gcc aag     288
Met Pro Phe Ile Gly Arg Lys Ile Glu Gln Gln Val Ser Lys Ala Lys
                85                  90                  95

aag gat ctt gtc aag aac atg cca ttc cta aag gtg gac aag gat tat     336
Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr
            100                 105                 110

gtg aaa act ctg cct gct cag ggt atg ggc aca gct gag gtt ctg gag     384
Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu
        115                 120                 125

aga ctc aag gag tac agc tcc atg gat ggt tcc tgg caa gaa ggg aaa     432
Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys
        130                 135                 140

gcc tca gga gct gtg tac aat ggg gaa ccg aag ctc acg gag ctg ctg     480
Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu
145                 150                 155                 160

gtg cag gct tat gga gaa ttc acg tgg agc aat cca ctg cat cca gat     528
Val Gln Ala Tyr Gly Glu Phe Thr Trp Ser Asn Pro Leu His Pro Asp
                165                 170                 175
```

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atc ttc cct gga ttg cgg aag tta gag gca gaa atc gtt agg atg act    576
Ile Phe Pro Gly Leu Arg Lys Leu Glu Ala Glu Ile Val Arg Met Thr
            180                 185                 190

tgt tcc ctc ttc aat ggg gga cca gat tcc tgt gga tgt gtg act tct    624
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
            195                 200                 205

ggg gga acg gaa agc atc ctg atg gcc tgc aaa gct tac cgg gac ttg    672
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Tyr Arg Asp Leu
            210                 215                 220

gcg tta gag aag ggg atc aaa act cca gaa att gtg gct ccc gag agt    720
Ala Leu Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Glu Ser
225                 230                 235                 240

gcc cat gct gca ttc gac aaa gca gct cat tat ttt ggg atg aag att    768
Ala His Ala Ala Phe Asp Lys Ala Ala His Tyr Phe Gly Met Lys Ile
                    245                 250                 255

gtc cga gtt gca ctg aaa aag aac atg gag gtg gat gtg cag gca atg    816
Val Arg Val Ala Leu Lys Lys Asn Met Glu Val Asp Val Gln Ala Met
                260                 265                 270

aag aga gcc atc tcc agg aac aca gct atg ctg gtc tgt tct acc cca    864
Lys Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
                275                 280                 285

cag ttt cct cat ggt gtg atg gat cct gtc ccc gaa gtg gcc aag tta    912
Gln Phe Pro His Gly Val Met Asp Pro Val Pro Glu Val Ala Lys Leu
            290                 295                 300

act gtc aga tat aaa atc cca ctc cat gtg gat gct tgt ctg ggg ggc    960
Thr Val Arg Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305                 310                 315                 320

ttc ctc att gtc ttc atg gag aaa gca ggg tac cca ctg gag aaa cca    1008
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu Lys Pro
                325                 330                 335

ttt gat ttc cgg gtg aaa ggt gtg acc agc att tca gca gat act cat    1056
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
            340                 345                 350

aag tat ggc tat gct cct aaa ggt tca tca gtg gtg atg tac tct aac    1104
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Val Val Met Tyr Ser Asn
            355                 360                 365

gag aag tac agg acg tac cag ttc ttt gtt ggt gca gac tgg caa ggt    1152
Glu Lys Tyr Arg Thr Tyr Gln Phe Phe Val Gly Ala Asp Trp Gln Gly
            370                 375                 380

ggt gtc tac gca tct cca agc ata gct ggc tca cgg cct ggt ggc atc    1200
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Gly Val Tyr Ala Ser Pro Ser Ile Ala Gly Ser Arg Pro Gly Gly Ile
385             390             395                 400

att gca gcc tgt tgg gcg gcc ttg atg cac ttc ggt gag aac ggc tat      1248
Ile Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
              405             410                 415

gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctg aag tca      1296
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
              420             425                 430

gaa ctg gaa aac atc aaa aac atc ttc att ttc ggt gat cct caa ttg      1344
Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu
              435             440                 445

tca gtt att gct ctg gga tcc aac gat ttt gac att tac cga cta tct      1392
Ser Val Ile Ala Leu Gly Ser Asn Asp Phe Asp Ile Tyr Arg Leu Ser
      450             455                 460

aat atg atg tct gct aag ggg tgg aat ttt aac tac ctg cag ttc cca      1440
Asn Met Met Ser Ala Lys Gly Trp Asn Phe Asn Tyr Leu Gln Phe Pro
465             470                 475                 480

aga agc att cat ttc tgc att acg tta gta cat act cgg aag cga gtg      1488
Arg Ser Ile His Phe Cys Ile Thr Leu Val His Thr Arg Lys Arg Val
              485                 490                 495

gcg atc cag ttc cta aag gat atc cgg gaa tca gtc aca caa atc atg      1536
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
              500                 505                 510

aag aat cct aaa gct aag acc aca gga atg ggt gcc atc tat ggc atg      1584
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met
              515                 520                 525

gcc cag gca acc att gac agg aag ctg gtt gca gaa ata tcc tcc gtc      1632
Ala Gln Ala Thr Ile Asp Arg Lys Leu Val Ala Glu Ile Ser Ser Val
      530                 535                 540

ttc ttg gac tgc ctt tat act acg gac ccc gtg act cag ggc aac cag      1680
Phe Leu Asp Cys Leu Tyr Thr Thr Asp Pro Val Thr Gln Gly Asn Gln
545             550                 555                 560

atg aac ggt tct cca aag ccc cgc tga                                  1707
Met Asn Gly Ser Pro Lys Pro Arg  *
              565
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<210> 6
<211> 568
<212> PRT
<213> Mus musculus

<400> 6

Met Pro Gly Thr Asp Leu Leu Lys Leu Lys Asp Phe Glu Pro Tyr Leu
1   5   10   15

Glu Ile Leu Glu Ser Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
           20   25   30

Tyr Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Leu
           35   40   45

Cys Thr Leu Leu Ile Val Trp Val Tyr Glu Leu Ile Phe Gln Pro Glu
           50   55   60

Ser Leu Trp Ser Arg Phe Lys Lys Lys Leu Phe Lys Leu Ile Arg Lys
65   70   75   80

Met Pro Phe Ile Gly Arg Lys Ile Glu Gln Gln Val Ser Lys Ala Lys
           85   90   95

Lys Asp Leu Val Lys Asn Met Pro Phe Leu Lys Val Asp Lys Asp Tyr
           100   105   110

Val Lys Thr Leu Pro Ala Gln Gly Met Gly Thr Ala Glu Val Leu Glu
           115   120   125

Arg Leu Lys Glu Tyr Ser Ser Met Asp Gly Ser Trp Gln Glu Gly Lys
           130   135   140

Ala Ser Gly Ala Val Tyr Asn Gly Glu Pro Lys Leu Thr Glu Leu Leu
145   150   155   160

Val Gln Ala Tyr Gly Glu Phe Thr Trp Ser Asn Pro Leu His Pro Asp
           165   170   175

Ile Phe Pro Gly Leu Arg Lys Leu Glu Ala Glu Ile Val Arg Met Thr
           180   185   190

Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
           195   200   205

Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Tyr Arg Asp Leu
           210   215   220

Ala Leu Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Glu Ser
225   230   235   240

Ala His Ala Ala Phe Asp Lys Ala Ala His Tyr Phe Gly Met Lys Ile
           245   250   255

Val Arg Val Ala Leu Lys Lys Asn Met Glu Val Asp Val Gln Ala Met
           260   265   270

Lys Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
           275   280   285

Gln Phe Pro His Gly Val Met Asp Pro Val Pro Glu Val Ala Lys Leu
           290   295   300

Thr Val Arg Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305   310   315   320

Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu Lys Pro
           325   330   335

Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
           340   345   350

Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Val Val Met Tyr Ser Asn
           355   360   365

Glu Lys Tyr Arg Thr Tyr Gln Phe Phe Val Gly Ala Asp Trp Gln Gly
           370   375   380

Gly Val Tyr Ala Ser Pro Ser Ile Ala Gly Ser Arg Pro Gly Gly Ile
385   390   395   400

Ile Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
           405   410   415

Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
           420   425   430

```
Glu Leu Glu Asn Ile Lys Asn Ile Phe Ile Phe Gly Asp Pro Gln Leu
        435             440             445
Ser Val Ile Ala Leu Gly Ser Asn Asp Phe Asp Ile Tyr Arg Leu Ser
        450             455             460
Asn Met Met Ser Ala Lys Gly Trp Asn Phe Asn Tyr Leu Gln Phe Pro
465             470             475             480
Arg Ser Ile His Phe Cys Ile Thr Leu Val His Thr Arg Lys Arg Val
            485             490             495
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
        500             505             510
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met
        515             520             525
Ala Gln Ala Thr Ile Asp Arg Lys Leu Val Ala Glu Ile Ser Ser Val
        530             535             540
Phe Leu Asp Cys Leu Tyr Thr Thr Asp Pro Val Thr Gln Gly Asn Gln
545             550             555             560
Met Asn Gly Ser Pro Lys Pro Arg
                565
```

<210> 7
<211> 1707
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)...(1707)

<400> 7

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atg cct agc aca gac ctt ctg atg ttg aag gcc ttt gag ccc tac tta    48
Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
  1           5              10              15

gag att ttg gaa gta tac tcc aca aaa gcc aag aat tat gta aat gga    96
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
            20              25              30

cat tgc acc aag tat gag ccc tgg cag cta att gca tgg agt gtc gtg   144
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
            35              40              45

tgg acc ctg ctg ata gtc tgg gga tat gag ttt gtc ttc cag cca gag   192
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
        50              55              60

agt tta tgg tca agg ttt aaa aag aaa tgt ttt aag ctc acc agg aag   240
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65              70              75              80

atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag   288
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
                85              90              95
```

```
gat gat att agc aag aac atg tca ttc ctg aaa gtg gac aaa gag tat    336
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
            100             105             110

gtg aaa gct tta ccc tcc cag ggt ctg agc tca tct gct gtt ttg gag    384
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
        115             120             125

aaa ctt aag gag tac agc tct atg gac gcc ttc tgg caa gag ggg aga    432
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
        130             135             140

gcc tct gga aca gtg tac agt ggg gag gag aag ctc act gag ctc ctt    480
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145             150             155             160

gtg aag gct tat gga gat ttt gca tgg agt aac ccc ctg cat cca gat    528
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
                165             170             175

atc ttc cca gga cta cgc aag ata gag gca gaa att gtg agg ata gct    576
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
            180             185             190

tgt tcc ctg ttc aat ggg gga cca gat tcg tgt gga tgt gtg act tct    624
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
            195             200             205

ggg gga aca gaa agc ata ctc atg gcc tgc aaa gca tgt cgg gat ctg    672
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
        210             215             220

gcc ttt gag aag ggg atc aaa act cca gaa att gtg gct ccc caa agt    720
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225             230             235             240

gcc cat gct gca ttt aac aaa gca gcc agt tac ttt ggg atg aag att    768
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
                245             250             255

gtg cgg gtc cca ttg acg aag atg atg gag gtg gat gtg agg gca atg    816
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
            260             265             270

aga aga gct atc tcc agg aac act gcc atg ctc gtc tgt tct acc cca    864
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
        275             280             285

cag ttt cct cat ggt gta ata gat cct gtc cct gaa gtg gcc aag ctg    912
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
        290             295             300

gct gtc aaa tac aaa ata ccc ctt cat gtc gac gct tgt ctg gga ggc    960
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
```

```
        305                     310                     315                     320

ttc ctc atc gtc ttt atg gag aaa gca gga tac cca ctg gag cac cca    1008
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
                325                     330                     335

ttt gat ttc cgg gtg aaa ggt gta acc agc att tca gct gac acc cat    1056
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
                340                     345                     350

aag tat ggc tat gcc cca aaa ggc tca tca ttg gtg ttg tat agt gac    1104
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp
                355                     360                     365

aag aag tac agg aac tat cag ttc ttc gtc gat aca gat tgg cag ggt    1152
Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly
                370                     375                     380

ggc atc tat gct tcc cca acc atc gca ggc tca cgg cct ggt ggc att    1200
Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile
385                     390                     395                     400

agc gca gcc tgt tgg gct gcc ttg atg cac ttc ggt gag aac ggc tat    1248
Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
                405                     410                     415

gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctc aag tca    1296
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
                420                     425                     430

gaa ctg gaa aat atc aaa ggc atc ttt gtt ttt ggg aat ccc caa ttg    1344
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
                435                     440                     445

tca ctc att gct ctg gga tcc cgt gat ttt gac atc tac cga cta tca    1392
Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
                450                     455                     460

aac ctg atg act gct aag ggg tgg aac ttg aac cag ttg cag ttc cca    1440
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
465                     470                     475                     480

ccc agt att cat ttc tgc atc aca tta cta cac gcc cgg aaa cga gta    1488
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
                485                     490                     495

gct ata caa ttc cta aag gac att cga gaa tct gtc act caa atc atg    1536
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
                500                     505                     510

aag aat cct aaa gcg aag acc aca gga atg ggt gcc atc tat gcc atg    1584
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met
                515                     520                     525
```

```
gcc cag aca act gtt gac agg aat atg gtt gca gaa ttg tcc tca gtc    1632
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
    530                 535                 540

ttc ttg gac agc ttg tac agc acc gac act gtc acc cag ggc agc cag    1680
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
545                 550                 555                 560

atg aat ggt tct cca aaa ccc cac tga                                1707
Met Asn Gly Ser Pro Lys Pro His  *
                565
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<210> 8
<211> 568
<212> PRT
<213> Homo sapiens

<400> 8

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Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
 1               5                  10                  15
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
            20                  25                  30
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
            35                  40                  45
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
            50                  55                  60
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65                  70                  75                  80
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
                85                  90                  95
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
            100                 105                 110
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
            115                 120                 125
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
    130                 135                 140
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145                 150                 155                 160
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
                165                 170                 175
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
            180                 185                 190
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
            195                 200                 205
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
    210                 215                 220
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225                 230                 235                 240
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
                245                 250                 255
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
            260                 265                 270
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
```

```
            275                     280                     285
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
    290                     295                     300
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305                     310                     315                     320
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
                325                     330                     335
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
                340                     345                     350
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp
                355                     360                     365
Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly
        370                     375                     380
Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile
385                     390                     395                     400
Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
                405                     410                     415
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
                420                     425                     430
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
                435                     440                     445
Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
        450                     455                     460
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
465                     470                     475                     480
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
                485                     490                     495
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
                500                     505                     510
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met
                515                     520                     525
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
        530                     535                     540
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
545                     550                     555                     560
Met Asn Gly Ser Pro Lys Pro His
                565
```

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<210> 9
<211> 1467
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)...(1467)

<400> 9
atg cct agc aca gac ctt ctg atg ttg aag gcc ttt gag ccc tac tta    48
Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
 1               5                   10                  15


gag att ttg gaa gta tac tcc aca aaa gcc aag aat tat gta aat gga    96
```

```
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
              20                  25                  30

cat tgc acc aag tat gag ccc tgg cag cta att gca tgg agt gtc gtg      144
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
              35                  40                  45

tgg acc ctg ctg ata gtc tgg gga tat gag ttt gtc ttc cag cca gag      192
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
          50                  55                  60

agt tta tgg tca agg ttt aaa aag aaa tgt ttt aag ctc acc agg aag      240
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65          Leu          70          75                  80

atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag      288
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
                  85                  90                  95

gat gat att agc aag aac atg tca ttc ctg aaa gtg gac aaa gag tat      336
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
                  100                 105                 110

gtg aaa gct tta ccc tcc cag ggt ctg agc tca tct gct gtt ttg gag      384
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
              115                 120                 125

aaa ctt aag gag tac agc tct atg gac gcc ttc tgg caa gag ggg aga      432
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
              130                 135                 140

gcc tct gga aca gtg tac agt ggg gag gag aag ctc act gag ctc ctt      480
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145                 150                 155                 160

gtg aag gct tat gga gat ttt gca tgg agt aac ccc ctg cat cca gat      528
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
                  165                 170                 175

atc ttc cca gga cta cgc aag ata gag gca gaa att gtg agg ata gct      576
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
                  180                 185                 190

tgt tcc ctg ttc aat ggg gga cca gat tcg tgt gga tgt gtg act tct      624
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
              195                 200                 205

ggg gga aca gaa agc ata ctc atg gcc tgc aaa gca tgt cgg gat ctg      672
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
              210                 215                 220

gcc ttt gag aag ggg atc aaa act cca gaa att gtg gct ccc caa agt      720
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225                 230                 235                 240
```

```
gcc cat gct gca ttt aac aaa gca gcc agt tac ttt ggg atg aag att    768
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
                245                 250                 255

gtg cgg gtc cca ttg acg aag atg atg gag gtg gat gtg agg gca atg    816
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
                260                 265                 270

aga aga gct atc tcc agg aac act gcc atg ctc gtc tgt tct acc cca    864
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
                275                 280                 285

cag ttt cct cat ggt gta ata gat cct gtc cct gaa gtg gcc aag ctg    912
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
                290                 295                 300

gct gtc aaa tac aaa ata ccc ctt cat gtc gac gct tgt ctg gga ggc    960
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305                 310                 315                 320

ttc ctc atc gtc ttt atg gag aaa gca gga tac cca ctg gag cac cca   1008
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
                325                 330                 335

ttt gat ttc cgg gtg aaa ggt gta acc agc att tca gct gac acc cat   1056
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
                340                 345                 350

aag ctg gaa aat atc aaa ggc atc ttt gtt ttt ggg aat ccc caa ttg   1104
Lys Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
                355                 360                 365

tca ctc att gct ctg gga tcc cgt gat ttt gac atc tac cga cta tca   1152
Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
                370                 375                 380

aac ctg atg act gct aag ggg tgg aac ttg aac cag ttg cag ttc cca   1200
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
385                 390                 395                 400

ccc agt att cat ttc tgc atc aca tta cta cac gcc cgg aaa cga gta   1248
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
                405                 410                 415

gct ata caa ttc cta aag gac att cga gaa tct gtc act caa atc atg   1296
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
                420                 425                 430

aag aat cct aaa gcg aag acc aca gga atg ggt gcc atc tat gcc atg   1344
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met
                435                 440                 445

gcc cag aca act gtt gac agg aat atg gtt gca gaa ttg tcc tca gtc   1392
```

```
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
    450             455             460

ttc ttg gac agc ttg tac agc acc gac act gtc acc cag ggc agc cag     1440
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
465             470             475             480

atg aat ggt tct cca aaa ccc cac tga                                 1467
Met Asn Gly Ser Pro Lys Pro His  *
                485
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<210> 10
<211> 488
<212> PRT
<213> Homo sapiens

<400> 10

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Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
  1             5              10              15
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
         20              25              30
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
         35              40              45
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
         50              55              60
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65              70              75              80
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
                85              90              95
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
            100             105             110
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
            115             120             125
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
        130             135             140
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145             150             155             160
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
                165             170             175
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
            180             185             190
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
            195             200             205
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Cys Arg Asp Leu
        210             215             220
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225             230             235             240
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
                245             250             255
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
            260             265             270
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
        275             280             285
```

```
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
    290             295             300
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305             310             315             320
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
            325             330             335
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
        340             345             350
Lys Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
        355             360             365
Ser Leu Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
    370             375             380
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
385             390             395             400
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
            405             410             415
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
            420             425             430
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Ala Met
        435             440             445
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
    450             455             460
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
465             470             475             480
Met Asn Gly Ser Pro Lys Pro His
            485
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<210> 11
<211> 552
<212> PRT
<213> C. elegans

<400> 11
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Met Asp Ser Val Lys His Thr Thr Glu Ile Ile Val Asp Leu Thr Lys
1               5               10              15
Met His Tyr His Met Ile Asn Asp Arg Leu Ser Arg Tyr Asp Pro Val
            20              25              30
Val Leu Val Leu Ala Ala Phe Gly Gly Thr Leu Val Tyr Thr Lys Val
        35              40              45
Val His Leu Tyr Arg Lys Ser Glu Asp Pro Ile Leu Lys Arg Met Gly
    50              55              60
Ala Tyr Val Phe Ser Leu Leu Arg Lys Leu Pro Ala Val Arg Asp Lys
65              70              75              80
Ile Glu Lys Glu Leu Ala Ala Glu Lys Pro Lys Leu Ile Glu Ser Ile
            85              90              95
His Lys Asp Asp Lys Asp Lys Gln Phe Ile Ser Thr Leu Pro Ile Ala
        100             105             110
Pro Leu Ser Gln Asp Ser Ile Met Glu Leu Ala Lys Lys Tyr Glu Asp
        115             120             125
Tyr Asn Thr Phe Asn Ile Asp Gly Gly Arg Val Ser Gly Ala Val Tyr
        130             135             140
Thr Asp Arg His Ala Glu His Ile Asn Leu Leu Gly Lys Ile Tyr Glu
145             150             155             160
```

Lys Tyr Ala Phe Ser Asn Pro Leu His Pro Asp Val Phe Pro Gly Ala
                165   170   175
Arg Lys Met Glu Ala Glu Leu Ile Arg Met Val Leu Asn Leu Tyr Asn
            180   185   190
Gly Pro Glu Asp Ser Ser Gly Ser Val Thr Ser Gly Gly Thr Glu Ser
            195   200   205
Ile Ile Met Ala Cys Phe Ser Tyr Arg Asn Arg Ala His Ser Leu Gly
        210   215   220
Ile Glu His Pro Val Ile Leu Ala Cys Lys Thr Ala His Ala Ala Phe
225   230   235   240
Asp Lys Ala Ala His Leu Cys Gly Met Arg Leu Arg His Val Pro Val
            245   250   255
Asp Ser Asp Asn Arg Val Asp Leu Lys Glu Met Glu Arg Leu Ile Asp
            260   265   270
Ser Asn Val Cys Met Leu Val Gly Ser Ala Pro Asn Phe Pro Ser Gly
            275   280   285
Thr Ile Asp Pro Ile Pro Glu Ile Ala Lys Leu Gly Lys Lys Tyr Gly
            290   295   300
Ile Pro Val His Val Asp Ala Cys Leu Gly Gly Phe Met Ile Pro Phe
305   310   315   320
Met Asn Asp Ala Gly Tyr Leu Ile Pro Val Phe Asp Phe Arg Asn Pro
            325   330   335
Gly Val Thr Ser Ile Ser Cys Asp Thr His Lys Tyr Gly Cys Thr Pro
            340   345   350
Lys Gly Ser Ser Ile Val Met Tyr Arg Ser Lys Glu Leu His His Phe
            355   360   365
Gln Tyr Phe Ser Val Ala Asp Trp Cys Gly Gly Ile Tyr Ala Thr Pro
            370   375   380
Thr Ile Ala Gly Ser Arg Ala Gly Ala Asn Thr Ala Val Ala Trp Ala
385   390   395   400
Thr Leu Leu Ser Phe Gly Arg Asp Glu Tyr Val Arg Arg Cys Ala Gln
            405   410   415
Ile Val Lys His Thr Arg Met Leu Ala Glu Lys Ile Glu Lys Ile Lys
            420   425   430
Trp Ile Lys Pro Tyr Gly Lys Ser Asp Val Ser Leu Val Ala Phe Ser
            435   440   445
Gly Asn Gly Val Asn Ile Tyr Glu Val Ser Asp Lys Met Met Lys Leu
        450   455   460
Gly Trp Asn Leu Asn Thr Leu Gln Asn Pro Ala Ala Ile His Ile Cys
465   470   475   480
Leu Thr Ile Asn Gln Ala Asn Glu Glu Val Val Asn Ala Phe Ala Val
            485   490   495
Asp Leu Glu Lys Ile Cys Glu Glu Leu Ala Ala Lys Gly Glu Gln Lys
            500   505   510
Ala Asp Ser Gly Met Ala Ala Met Tyr Gly Met Ala Ala Gln Val Pro
            515   520   525
Lys Ser Val Val Asp Glu Val Ile Ala Leu Tyr Ile Asp Ala Thr Tyr
            530   535   540
Ser Ala Pro Pro Ser Thr Ser Asn
545   550

<210> 12
<211> 3162

<212> DNA
<213> C. elegans

<400> 12
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atggattcgg ttaagcacac aaccgaaatt attgtcgact tgacaaaaat gcactatcac  60
atgataaatg ataggtgaat tttaaacaaa aattagatat ttggaaatta ctaattcaag 120
attttcagac tttctcggta tgatccggtt gttctagtgt tggccgcttt tggggggtacc 180
cttgtctata caaaagtcgt ccatttgtac cgaaaaagcg aggatccaat tttgaaacgg 240
caagtgtttt cttgcgaatt ttagaaatat caaaatgaaa ttttcagcat gggagcttat 300
gtattctcac ttcttcgaaa acttccagct gttcgggata aaatcgaaaa agagctggct 360
gctgagaagc caaagcttat tgaatcgatt cataaggatg ataaggacaa gcaattcatt 420
tccagtttgt ttgaacattt attaattaac caattcatta attctatttt tcagctcttc 480
ccatcgctcc attatctcag gactcaatta tggaactggc gaaaaaatat gaggattaca 540
acacatttaa cattgacgga ggacgagtat ctggagcggt ttatactgat cgtcatgctg 600
aacacattaa tttgcttgga aaggtttaga aattctagaa tttttcaaaa tcttagctct 660
caaatatatt ctcttgtaaa tagctacata gtatatcctg tagggaagct ttgaatccaa 720
ttcagatcag gggcgacaaa cgattttttc cggcaaatcg gcaaatcgcc ggaatggaaa 780
tttcctgcaa atcggcaaat tgccggaatg gaaatttcct gcaagttggc aaattgacgg 840
aattgaaatt tccggcaaac cgacaaattt ccgtaattaa aatttcctgc aaaccggcga 900
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ttttctggaa atttcaggca aaattgtacg catcctatga atatccctat taacatcttt 1200
tttgaaaagt cagtaaatta tatgaaaata tctaaagaaa acggggaaaa tatttcaaag 1260
aggcacagtt ttatgtgttt ccgtcatcta aatagtccct ctaaacattt ccggcaaatc 1320
tgatatccgg caaacggcaa atcgggatat tgccggaatt taaaatttgc cgaacttgtc 1380
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cagaaatcgt gcacactctc ttggcattga acatccagtt attttggcat gtaaaacagc 1860
tcacgcggca tttgataagg ccgcccatct atgcggaatg cgtcttcgcc acgttccagt 1920
tgattcggat aatcgtgtcg atttaaaaga aatggagaga ctaattgatt cgaatgtttg 1980
tatgttggtt ggctcagcgc ctaacttccc atcaggcaca attgatccaa ttccggaaat 2040
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aaaattacat tgtgagcggg aactctaatt gaattcagca aaaatacgat actttttttct 2160
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gtttctgaca aaatgatgaa gctcggatgg aatttgaaca ctctgcagaa tccagcggcg 2880
tatgtttatc aattttatga gttatcagct tgctaaattt tttgtttcag aatccacatt 2940
tgtttgacaa tcaatcaagc gaacgaggaa gttgtgaatg cgttcgccgt cgaccttgag 3000
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```
aagatttgtg aagaactcgc tgcaaaaggt gaacaaaaag ctgacagtgg aatggctgcg 3060
atgtatggaa tggctgcgca agtaccaaaa tcagtagtgg acgaggttat cgctctgtac 3120
attgacgcaa cttattcagc tccaccttca acttctaatt aa                      3162
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<210> 13
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 13
gaggaattca tggattcggt taagcacaca accg                                  34
```

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<210> 14
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 14
agcctcgagt taattagaag ttgaaggtgg agc                                   33
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<210> 15
<211> 1638
<212> DNA
<213> Drosophila melanogaster

<400> 15
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ttcggcgcca aggagccctg gcaggtggcc accatcacgg ccaccacggt gctgggaggc 120
gtctggctct ggactgtgat ctgccaggat gaaaatcttt acattcgtgg caagcgtcag 180
ttctttaagt ttgccaagaa gattccagcc gtgcgtcgtc aggtggagac tgaattggcc 240
aaggccaaaa acgacttcga gacggaaatc aaaaagagca acgcccacct tacctactcg 300
gaaactctgc ccgagaaggg actcagcaag gaggagatcc tccgactggt ggatgagcac 360
ctgaagactg gtcactacaa ctggcgtgat ggtcgtgtat ctggcgcggt ctacggctac 420
aagcctgatc tggtggagct cgtcactgaa gtgtacggca aggcctccta caccaatccc 480
ttgcacgcag atctttttccc gggagtttgc aaaatggagg cggaggtagt gcgcatggca 540
tgcaacctgt tccatggaaa ctcagccagc tgtggaacca tgaccaccgg cggcaccgaa 600
tccattgtaa tggccatgaa ggcgtacagg gatttcgcta gagagtacaa gggaatcacc 660
aggccaaaca tcgtggtgcc taagacggtc cacgcggcct cgacaaggg cggtcagtac 720
tttaatatcc acgtgcgatc cgtggatgta gatccggaga cctacgaagt ggacattaag 780
aagttcaaac gtgccattaa caggaacacg attctgctgg ttgggtctgc tccgaacttc 840
ccctatggaa ccatcgatga catcgaagct atcgccgctt tgggcgttaa gtacgacatt 900
cccgtgcacg tggacgcctg cctgggcagc tttgtggtgg ccttggtccg caacgccggc 960
tataagctgc gtcccttcga ctttgaggtc aagggagtga ccagtatctc cgctgatacc 1020
cacaagtatg gtttcgcgcc caagggatca tcggtgatcc tttactcgga caagaagtac 1080
aaggaccatc agttcactgt gactactgac tggcctggcg gcgtgtatgg ttctcccaca 1140
gtcaacggtt cccgtgccgg aggtattatc gccgcctgct gggctaccat gatgagcttt 1200
ggctatgatg gttatctgga agccactaag cgcattgtgg atacggcgcg ctatatcgag 1260
aggggcgttc gcgacatcga tggcatcttt atctttggca agccagctac ttcagtgatt 1320
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```
gccctgggtt ccaatgtgtt tgacattttc cggctatcgg attcgctgtg caaactgggc 1380
tggaacctaa atgcgctgca gtttccatct ggtatccacc tgtgcgtgac ggacatgcac 1440
acacagcccg gagtcgcgga taaattcatt gccgatgtgc gcagctgtac ggcggagatc 1500
atgaaggatc ccggccagcc cgtcgttgga aagatggctc tttacggcat ggcacagagc 1560
atacccgacc gttcggtgat cggagaagtg actcgcctat tcctgcactc catgtactac 1620
actcccagcc agaaatag                                              1638
```

<210> 16
<211> 545
<212> PRT
<213> Drosophila melanogaster

<400> 16

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Met Arg Pro Phe Ser Gly Ser Asp Cys Leu Lys Pro Val Thr Glu Gly
 1               5                  10                  15
Ile Asn Arg Ala Phe Gly Ala Lys Glu Pro Trp Gln Val Ala Thr Ile
            20                  25                  30
Thr Ala Thr Thr Val Leu Gly Gly Val Trp Leu Trp Thr Val Ile Cys
            35                  40                  45
Gln Asp Glu Asn Leu Tyr Ile Arg Gly Lys Arg Gln Phe Phe Lys Phe
        50                  55                  60
Ala Lys Lys Ile Pro Ala Val Arg Arg Gln Val Glu Thr Glu Leu Ala
65                  70                  75                  80
Lys Ala Lys Asn Asp Phe Glu Thr Glu Ile Lys Lys Ser Asn Ala His
                85                  90                  95
Leu Thr Tyr Ser Glu Thr Leu Pro Glu Lys Gly Leu Ser Lys Glu Glu
            100                 105                 110
Ile Leu Arg Leu Val Asp Glu His Leu Lys Thr Gly His Tyr Asn Trp
            115                 120                 125
Arg Asp Gly Arg Val Ser Gly Ala Val Tyr Gly Tyr Lys Pro Asp Leu
        130                 135                 140
Val Glu Leu Val Thr Glu Val Tyr Gly Lys Ala Ser Tyr Thr Asn Pro
145                 150                 155                 160
Leu His Ala Asp Leu Phe Pro Gly Val Cys Lys Met Glu Ala Glu Val
                165                 170                 175
Val Arg Met Ala Cys Asn Leu Phe His Gly Asn Ser Ala Ser Cys Gly
            180                 185                 190
Thr Met Thr Thr Gly Gly Thr Glu Ser Ile Val Met Ala Met Lys Ala
            195                 200                 205
Tyr Arg Asp Phe Ala Arg Glu Tyr Lys Gly Ile Thr Arg Pro Asn Ile
        210                 215                 220
Val Val Pro Lys Thr Val His Ala Ala Phe Asp Lys Gly Gly Gln Tyr
225                 230                 235                 240
Phe Asn Ile His Val Arg Ser Val Asp Val Asp Pro Glu Thr Tyr Glu
                245                 250                 255
Val Asp Ile Lys Lys Phe Lys Arg Ala Ile Asn Arg Asn Thr Ile Leu
            260                 265                 270
Leu Val Gly Ser Ala Pro Asn Phe Pro Tyr Gly Thr Ile Asp Asp Ile
            275                 280                 285
Glu Ala Ile Ala Ala Leu Gly Val Lys Tyr Asp Ile Pro Val His Val
        290                 295                 300
Asp Ala Cys Leu Gly Ser Phe Val Val Ala Leu Val Arg Asn Ala Gly
305                 310                 315                 320
Tyr Lys Leu Arg Pro Phe Asp Phe Glu Val Lys Gly Val Thr Ser Ile
```

```
                     325                          330                          335
Ser Ala Asp Thr His Lys Tyr Gly Phe Ala Pro Lys Gly Ser Ser Val
            340                          345                          350
Ile Leu Tyr Ser Asp Lys Lys Tyr Lys Asp His Gln Phe Thr Val Thr
            355                          360                          365
Thr Asp Trp Pro Gly Gly Val Tyr Gly Ser Pro Thr Val Asn Gly Ser
            370                          375                          380
Arg Ala Gly Gly Ile Ile Ala Ala Cys Trp Ala Thr Met Met Ser Phe
385                          390                          395                          400
Gly Tyr Asp Gly Tyr Leu Glu Ala Thr Lys Arg Ile Val Asp Thr Ala
                     405                          410                          415
Arg Tyr Ile Glu Arg Gly Val Arg Asp Ile Asp Gly Ile Phe Ile Phe
            420                          425                          430
Gly Lys Pro Ala Thr Ser Val Ile Ala Leu Gly Ser Asn Val Phe Asp
            435                          440                          445
Ile Phe Arg Leu Ser Asp Ser Leu Cys Lys Leu Gly Trp Asn Leu Asn
            450                          455                          460
Ala Leu Gln Phe Pro Ser Gly Ile His Leu Cys Val Thr Asp Met His
465                          470                          475                          480
Thr Gln Pro Gly Val Ala Asp Lys Phe Ile Ala Asp Val Arg Ser Cys
                     485                          490                          495
Thr Ala Glu Ile Met Lys Asp Pro Gly Gln Pro Val Val Gly Lys Met
                     500                          505                          510
Ala Leu Tyr Gly Met Ala Gln Ser Ile Pro Asp Arg Ser Val Ile Gly
            515                          520                          525
Glu Val Thr Arg Leu Phe Leu His Ser Met Tyr Tyr Thr Pro Ser Gln
            530                          535                          540
Lys
545
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<210> 17
<211> 1707
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)...(1707)

<400> 17

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atg cct agc aca gac ctt ctg atg ttg aag gcc ttt gag ccc tac tta    48
Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
 1               5                  10                  15

gag att ttg gaa gta tac tcc aca aaa gcc aag aat tat gta aat gga    96
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
            20                  25                  30

cat tgc acc aag tat gag ccc tgg cag cta att gca tgg agt gtc gtg   144
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
            35                  40                  45

tgg acc ctg ctg ata gtc tgg gga tat gag ttt gtc ttc cag cca gag   192
```

```
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
    50                  55              60

agt tta tgg tca agg ttt aaa aag aaa tgt ttt aag ctc acc agg aag    240
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65                  70              75                  80

atg ccc att att ggt cgt aag att caa gac aag ttg aac aag acc aag    288
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
                    85              90                  95

gat gat att agc aag aac atg tca ttc ctg aaa gtg gac aaa gag tat    336
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
                100             105             110

gtg aaa gct tta ccc tcc cag ggt ctg agc tca tct gct gtt ttg gag    384
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
            115             120             125

aaa ctt aag gag tac agc tct atg gac gcc ttc tgg caa gag ggg aga    432
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
        130             135             140

gcc tct gga aca gtg tac agt ggg gag gag aag ctc act gag ctc ctt    480
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145             150             155             160

gtg aag gct tat gga gat ttt gca tgg agt aac ccc ctg cat cca gat    528
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
                165             170             175

atc ttc cca gga cta cgc aag ata gag gca gaa att gtg agg ata gct    576
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
                180             185             190

tgt tcc ctg ttc aat ggg gga cca gat tcg tgt gga tgt gtg act tct    624
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
            195             200             205

ggg gga aca gaa agc ata ctc atg gcc tgc aaa gca tat cgg gat ctg    672
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Tyr Arg Asp Leu
        210             215             220

gcc ttt gag aag ggg atc aaa act cca gaa att gtg gct ccc caa agt    720
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225                 230             235             240

gcc cat gct gca ttt aac aaa gca gcc agt tac ttt ggg atg aag att    768
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
                245             250             255

gtg cgg gtc cca ttg acg aag atg atg gag gtg gat gtg agg gca atg    816
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
            260             265             270
```

```
aga aga gct atc tcc agg aac act gcc atg ctc gtc tgt tct acc cca     864
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
        275             280             285

cag ttt cct cat ggt gta ata gat cct gtc cct gaa gtg gcc aag ctg     912
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
        290             295             300

gct gtc aaa tac aaa ata ccc ctt cat gtc gac gct tgt ctg gga ggc     960
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305             310             315             320

ttc ctc atc gtc ttt atg gag aaa gca gga tac cca ctg gag cac cca    1008
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
                325             330             335

ttt gat ttc cgg gtg aaa ggt gta acc agc att tca gct gac acc cat    1056
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
                340             345             350

aag tat ggc tat gcc cca aaa ggc tca tca ttg gtg ttg tat agt gac    1104
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp
                355             360             365

aag aag tac agg aac tat cag ttc ttc gtc gat aca gat tgg cag ggt    1152
Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly
        370             375             380

ggc atc tat gct tcc cca acc atc gca ggc tca cgg cct ggt ggc att    1200
Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile
385             390             395             400

agc gca gcc tgt tgg gct gcc ttg atg cac ttc ggt gag aac ggc tat    1248
Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
                405             410             415

gtt gaa gct acc aaa cag atc atc aaa act gct cgc ttc ctc aag tca    1296
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
                420             425             430

gaa ctg gaa aat atc aaa ggc atc ttt gtt ttt ggg aat ccc caa ttg    1344
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
        435             440             445

tca gtc att gct ctg gga tcc cgt gat ttt gac atc tac cga cta tca    1392
Ser Val Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
        450             455             460

aac ctg atg act gct aag ggg tgg aac ttg aac cag ttg cag ttc cca    1440
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
465             470             475             480

ccc agt att cat ttc tgc atc aca tta cta cac gcc cgg aaa cga gta    1488
```

```
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
                 485                 490             495
```

```
gct ata caa ttc cta aag gac att cga gaa tct gtc act caa atc atg    1536
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
            500                 505             510
```

```
aag aat cct aaa gcg aag acc aca gga atg ggt gcc atc tat ggc atg    1584
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met
            515                 520             525
```

```
gcc cag aca act gtt gac agg aat atg gtt gca gaa ttg tcc tca gtc    1632
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
            530                 535             540
```

```
ttc ttg gac agc ttg tac agc acc gac act gtc acc cag ggc agc cag    1680
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
545             550                 555                 560
```

```
atg aat ggt tct cca aaa ccc cac tga                                1707
Met Asn Gly Ser Pro Lys Pro His  *
                565
```

```
<210> 18
<211> 568
<212> PRT
<213> Homo sapiens
```

```
<400> 18
Met Pro Ser Thr Asp Leu Leu Met Leu Lys Ala Phe Glu Pro Tyr Leu
1               5               10              15
Glu Ile Leu Glu Val Tyr Ser Thr Lys Ala Lys Asn Tyr Val Asn Gly
            20              25              30
His Cys Thr Lys Tyr Glu Pro Trp Gln Leu Ile Ala Trp Ser Val Val
            35              40              45
Trp Thr Leu Leu Ile Val Trp Gly Tyr Glu Phe Val Phe Gln Pro Glu
    50              55              60
Ser Leu Trp Ser Arg Phe Lys Lys Lys Cys Phe Lys Leu Thr Arg Lys
65              70              75              80
Met Pro Ile Ile Gly Arg Lys Ile Gln Asp Lys Leu Asn Lys Thr Lys
            85              90              95
Asp Asp Ile Ser Lys Asn Met Ser Phe Leu Lys Val Asp Lys Glu Tyr
            100             105             110
Val Lys Ala Leu Pro Ser Gln Gly Leu Ser Ser Ser Ala Val Leu Glu
            115             120             125
Lys Leu Lys Glu Tyr Ser Ser Met Asp Ala Phe Trp Gln Glu Gly Arg
    130             135             140
Ala Ser Gly Thr Val Tyr Ser Gly Glu Glu Lys Leu Thr Glu Leu Leu
145             150             155             160
Val Lys Ala Tyr Gly Asp Phe Ala Trp Ser Asn Pro Leu His Pro Asp
            165             170             175
Ile Phe Pro Gly Leu Arg Lys Ile Glu Ala Glu Ile Val Arg Ile Ala
            180             185             190
```

```
Cys Ser Leu Phe Asn Gly Gly Pro Asp Ser Cys Gly Cys Val Thr Ser
        195             200             205
Gly Gly Thr Glu Ser Ile Leu Met Ala Cys Lys Ala Tyr Arg Asp Leu
    210             215             220
Ala Phe Glu Lys Gly Ile Lys Thr Pro Glu Ile Val Ala Pro Gln Ser
225             230             235             240
Ala His Ala Ala Phe Asn Lys Ala Ala Ser Tyr Phe Gly Met Lys Ile
            245             250             255
Val Arg Val Pro Leu Thr Lys Met Met Glu Val Asp Val Arg Ala Met
        260             265             270
Arg Arg Ala Ile Ser Arg Asn Thr Ala Met Leu Val Cys Ser Thr Pro
        275             280             285
Gln Phe Pro His Gly Val Ile Asp Pro Val Pro Glu Val Ala Lys Leu
    290             295             300
Ala Val Lys Tyr Lys Ile Pro Leu His Val Asp Ala Cys Leu Gly Gly
305             310             315             320
Phe Leu Ile Val Phe Met Glu Lys Ala Gly Tyr Pro Leu Glu His Pro
            325             330             335
Phe Asp Phe Arg Val Lys Gly Val Thr Ser Ile Ser Ala Asp Thr His
        340             345             350
Lys Tyr Gly Tyr Ala Pro Lys Gly Ser Ser Leu Val Leu Tyr Ser Asp
        355             360             365
Lys Lys Tyr Arg Asn Tyr Gln Phe Phe Val Asp Thr Asp Trp Gln Gly
370             375             380
Gly Ile Tyr Ala Ser Pro Thr Ile Ala Gly Ser Arg Pro Gly Gly Ile
385             390             395             400
Ser Ala Ala Cys Trp Ala Ala Leu Met His Phe Gly Glu Asn Gly Tyr
            405             410             415
Val Glu Ala Thr Lys Gln Ile Ile Lys Thr Ala Arg Phe Leu Lys Ser
        420             425             430
Glu Leu Glu Asn Ile Lys Gly Ile Phe Val Phe Gly Asn Pro Gln Leu
    435             440             445
Ser Val Ile Ala Leu Gly Ser Arg Asp Phe Asp Ile Tyr Arg Leu Ser
    450             455             460
Asn Leu Met Thr Ala Lys Gly Trp Asn Leu Asn Gln Leu Gln Phe Pro
465             470             475             480
Pro Ser Ile His Phe Cys Ile Thr Leu Leu His Ala Arg Lys Arg Val
            485             490             495
Ala Ile Gln Phe Leu Lys Asp Ile Arg Glu Ser Val Thr Gln Ile Met
            500             505             510
Lys Asn Pro Lys Ala Lys Thr Thr Gly Met Gly Ala Ile Tyr Gly Met
        515             520             525
Ala Gln Thr Thr Val Asp Arg Asn Met Val Ala Glu Leu Ser Ser Val
        530             535             540
Phe Leu Asp Ser Leu Tyr Ser Thr Asp Thr Val Thr Gln Gly Ser Gln
545             550             555             560
Met Asn Gly Ser Pro Lys Pro His
            565
```

<210> 19
<211> 490
<212> PRT
<213> Drosophila melanogaster

<400> 19

```
Phe Arg Ser Ser Asn Asp Tyr Gly Val Asn Leu Gln Thr Ala Glu Met
 1               5                  10                  15
Trp His His Thr Ile Arg Lys His Lys Arg Gly Asn Gly Ser Ser Ser
            20                  25                  30
Pro Ala Asp Cys Gly Lys Gln Leu Leu Ile Leu Leu Asn Pro Lys Ser
            35                  40                  45
Gly Ser Gly Lys Gly Arg Glu Leu Phe Gln Lys Gln Val Ala Pro Leu
    50                  55                  60
Leu Thr Glu Ala Glu Val Gln Tyr Asp Leu Gln Ile Thr Thr His Pro
65                  70                  75                  80
Gln Tyr Ala Lys Glu Phe Val Arg Thr Arg Arg Asp Leu Leu Thr Arg
                85                  90                  95
Tyr Ser Gly Ile Val Val Ala Ser Gly Asp Gly Leu Phe Tyr Glu Val
            100                 105                 110
Leu Asn Gly Leu Met Glu Arg Met Asp Trp Arg Arg Ala Cys Arg Glu
        115                 120                 125
Leu Pro Leu Gly Ile Ile Pro Cys Gly Ser Gly Asn Gly Leu Ala Lys
    130                 135                 140
Ser Val Ala His His Cys Asn Glu Pro Tyr Glu Pro Lys Pro Ile Leu
145                 150                 155                 160
His Ala Thr Leu Thr Cys Met Ala Gly Lys Ser Thr Pro Met Asp Val
            165                 170                 175
Val Arg Val Glu Leu Ala Thr Arg Asp Lys His Phe Val Met Tyr Ser
            180                 185                 190
Phe Leu Ser Val Gly Trp Gly Leu Ile Ala Asp Ile Asp Ile Glu Ser
    195                 200                 205
Glu Arg Leu Arg Ser Ile Gly Ala Gln Arg Phe Thr Leu Trp Ala Ile
    210                 215                 220
Lys Arg Leu Ile Gly Leu Arg Ser Tyr Lys Gly Arg Val Ser Tyr Leu
225                 230                 235                 240
Leu Gly Lys Gly Lys Lys Glu Pro Pro Val Glu Ala Ala Arg Glu Leu
            245                 250                 255
Pro Ala Glu Ser Thr Ala Ala Gly Ile Arg Ser Ser Leu Pro Leu Asn
            260                 265                 270
Ala Gly Glu Phe His Asp Leu Pro Glu Glu Glu Glu Gly Glu Ala Val
            275                 280                 285
Leu Asp Gly Glu Gln Phe Ala Asp Ala Ile Ser Leu Asp Arg Ser Val
    290                 295                 300
Tyr Arg Gln His Ala Asp Ser Trp His Ser Ala Met Ser Arg Arg Thr
305                 310                 315                 320
Ala Tyr Tyr Ser Leu Gly Gly Pro Ser Met Arg Ser Asn Arg Ser Arg
            325                 330                 335
Met Ser Ile Ser Gln Arg Ile Glu Ala Ala Asn Ala Glu Phe Ala Glu
            340                 345                 350
Arg Val Pro Thr Gly Thr Ile Pro Pro Leu Gln Met Pro Leu Leu Ser
    355                 360                 365
Ser Asp Gly Trp Ile Cys Glu Asp Gly Asp Phe Val Met Val His Ala
    370                 375                 380
Ala Tyr Thr Thr His Leu Ser Ser Asp Val Phe Phe Ala Pro Glu Ser
385                 390                 395                 400
Arg Leu Asp Asp Gly Leu Ile Tyr Leu Val Ile Ile Arg Arg Gly Val
            405                 410                 415
```

```
Ser Arg His Gln Leu Leu Asn Phe Met Leu Asn Leu Asn Ala Gly Thr
            420                 425                 430
His Leu Pro Ile Gly Glu Asp Pro Phe Ile Lys Val Val Pro Cys Arg
            435                 440                 445
Ala Phe Arg Ile Glu Pro Ser Ser Ser Asp Gly Ile Leu Val Val Asp
            450                 455                 460
Gly Glu Arg Val Glu Tyr Gly Pro Ile Gln Ala Glu Val Met Pro Gly
465                 470                 475                 480
Leu Ile Asn Val Met Thr Thr Ser Gly Gln
            485                 490
```

<210> 20
<211> 524
<212> PRT
<213> Drosophila melanogaster

<400> 20

```
Phe Arg Ser Phe Asp Thr Phe Glu Asp Asn Met Arg Glu Ala Asp Arg
 1               5                  10                  15
Trp Tyr Arg Ser Leu Arg Trp Gln Leu His Arg Thr Leu Glu Glu Ile
            20                  25                  30
Phe Val Ala Pro Thr Val Asp Glu Arg Arg Arg Arg Val Leu Val Leu
            35                  40                  45
Leu Asn Pro Lys Ser Gly Ser Gly Asp Ala Arg Glu Val Phe Asn Met
            50                  55                  60
His Val Thr Pro Val Leu Asn Glu Ala Glu Val Pro Tyr Asp Leu Tyr
65                  70                  75                  80
Val Thr Lys His Ser Asn Phe Ala Ile Glu Phe Leu Ser Thr Arg Cys
                85                  90                  95
Leu Asp Ala Trp Cys Cys Val Val Ala Val Gly Gly Asp Gly Leu Phe
            100                 105                 110
His Glu Ile Val Asn Gly Leu Leu Gln Arg Gln Asp Trp Ala His Val
            115                 120                 125
Leu Pro His Leu Ala Leu Gly Ile Ile Pro Cys Gly Ser Gly Asn Gly
            130                 135                 140
Leu Ala Arg Ser Ile Ala His Cys Tyr Asn Lys Pro Val Leu Gly Ala
145                 150                 155                 160
Ala Leu Thr Val Ile Ser Gly Arg Ser Ser Pro Met Asp Val Val Arg
                165                 170                 175
Val Gln Leu Gln Ser Arg Ser Leu Tyr Ser Phe Leu Ser Ile Gly Trp
            180                 185                 190
Gly Leu Ile Ser Asp Val Asp Ile Glu Ser Glu Arg Ile Arg Met Leu
            195                 200                 205
Gly Tyr Gln Arg Phe Thr Val Trp Thr Leu Tyr Arg Leu Val Asn Leu
            210                 215                 220
Arg Thr Tyr Asn Gly Arg Ile Ser Tyr Leu Leu Thr Asp His Glu Val
225                 230                 235                 240
Ser Ser Thr His Ser Ala Thr Gly Tyr Ala Ala Gln Arg Arg Met Gln
                245                 250                 255
Ser Ser Arg Ser Cys Asn Thr His Ile Asp Met Leu Asn Gly Pro Ala
            260                 265                 270
Pro Ile Tyr His Ser Ser Ala Glu Tyr Leu Pro Gln Glu Phe Ala Asp
            275                 280                 285
```

```
Val Ile Ser Leu Glu Thr Ser Ile Asn Gln Ser Phe Arg Ser Arg Cys
    290                 295             300
Asp Ser Trp Leu Ser Gly Gly Ser Arg Arg Ser Phe Tyr Tyr Ser Ile
305             310             315                 320
Ser Glu Ser Ile Tyr His Ser Leu Ala Asp Glu Ser Glu Phe Ala Gly
                325             330                 335
Leu Ala Ala Ala Ser Leu Glu Asn Arg Gln Gln Asn Tyr Gly Pro Ala
            340             345             350
Ser Glu Leu Pro Asp Leu Asn Glu Pro Leu Ser Glu Asp Gln Gly Trp
        355             360             365
Leu Val Glu Glu Gly Glu Phe Val Met Met His Ala Val Tyr Gln Thr
    370             375             380
His Leu Gly Ile Asp Cys His Phe Ala Pro Lys Ala Gln Leu Asn Asp
385             390             395                 400
Gly Thr Ile Tyr Leu Ile Leu Ile Arg Ala Gly Ile Ser Arg Pro His
                405             410                 415
Leu Leu Ser Phe Leu Tyr Asn Met Ser Ser Gly Thr His Leu Pro Glu
                420             425             430
Ser His Asp Asp His Val Lys Val Leu Pro Val Arg Ala Phe Arg Leu
        435             440             445
Glu Pro Tyr Asp Asn His Gly Ile Ile Thr Val Asp Gly Glu Arg Val
    450             455             460
Glu Phe Gly Pro Leu Gln Ala Glu Val Leu Pro Gly Ile Ala Arg Val
465             470             475                 480
Met Val Pro Asn Val Ser Thr Phe Arg Phe Gln Ser Ala Thr Leu Gln
            485             490             495
His Gly Ile Pro Val Cys Ile Pro Val Arg Lys Arg Phe Val Leu Tyr
        500             505             510
Asn Met Ser Ser Glu Glu Leu Ala Pro Ile Asn Glu
    515             520


<210> 21
<211> 368
<212> PRT
<213> Homo sapiens

<400> 21
Val Leu Val Leu Leu Asn Pro Arg Gly Gly Lys Gly Lys Ala Leu Gln
  1             5             10              15
Leu Phe Arg Ser His Val Gln Pro Leu Leu Ala Glu Ala Glu Ile Ser
        20              25              30
Phe Thr Leu Met Leu Thr Glu Arg Arg Asn His Ala Arg Glu Leu Val
        35              40              45
Arg Ser Glu Glu Leu Gly Arg Trp Asp Ala Leu Val Val Met Ser Gly
    50              55              60
Asp Gly Leu Met His Glu Val Val Asn Gly Leu Met Glu Arg Pro Asp
65              70              75                  80
Trp Glu Thr Ala Ile Gln Lys Pro Leu Cys Ser Leu Pro Ala Gly Ser
            85              90              95
Gly Asn Ala Leu Ala Ala Ser Leu Asn His Tyr Ala Gly Tyr Glu Gln
            100             105             110
Val Thr Asn Glu Asp Leu Leu Thr Asn Cys Thr Leu Leu Leu Cys Arg
        115             120             125
```

```
Arg Leu Leu Ser Pro Met Asn Leu Leu Ser Leu His Thr Ala Ser Gly
    130             135             140
Leu Arg Leu Phe Ser Val Leu Ser Leu Ala Trp Gly Phe Ile Ala Asp
145             150             155             160
Val Asp Leu Glu Ser Glu Lys Tyr Arg Arg Leu Gly Glu Met Arg Phe
                165             170             175
Thr Leu Gly Thr Phe Leu Arg Leu Ala Ala Leu Arg Thr Tyr Arg Gly
            180             185             190
Arg Leu Ala Tyr Leu Pro Val Gly Arg Val Gly Ser Lys Thr Pro Ala
        195             200             205
Ser Pro Val Val Val Gln Gln Gly Pro Val Asp Ala His Leu Val Pro
    210             215             220
Leu Glu Glu Pro Val Pro Ser His Trp Thr Val Val Pro Asp Glu Asp
225             230             235             240
Phe Val Leu Val Leu Ala Leu Leu His Ser His Leu Gly Ser Glu Met
            245             250             255
Phe Ala Ala Pro Met Gly Arg Cys Ala Ala Gly Val Met His Leu Phe
            260             265             270
Tyr Val Arg Ala Gly Val Ser Arg Ala Met Leu Leu Arg Leu Phe Leu
        275             280             285
Ala Met Glu Lys Gly Arg His Met Glu Tyr Glu Cys Pro Tyr Leu Val
    290             295             300
Tyr Val Pro Val Val Ala Phe Arg Leu Glu Pro Lys Asp Gly Lys Gly
305             310             315             320
Val Phe Ala Val Asp Gly Glu Leu Met Val Ser Glu Ala Val Gln Gly
            325             330             335
Gln Val His Pro Asn Tyr Phe Trp Met Val Ser Gly Cys Val Glu Pro
        340             345             350
Pro Pro Ser Trp Lys Pro Gln Gln Met Pro Pro Pro Glu Glu Pro Leu
    355             360             365
```